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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	37

Application Number	10/615,133
Filing Date	July 8, 2003
First Named Inventor	O'NEILL, Mary Morabito
Art Unit	3641
Examiner Name	CHAMBERS, T.
Attorney Docket Number	02W234

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):
  Return Receipt Postcard

Remarks

Title: Obscuration Method for Reducing the Infrared Signature of an Object

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Raytheon Company		
Signature	Leonard A Alkov		
Printed name	Leonard A. Alkov		
Date	March 16, 2007	Reg. No.	30,021

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Susan Antrillo		
Typed or printed name	Susan Antrillo	Date	March 16, 2007

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/17 (02-07)
Approved for use through 02/28/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2007

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	10/615,133
Filing Date	July 8, 2003
First Named Inventor	O'NEILL, Mary Morabito
Examiner Name	CHAMBERS, T.
Art Unit	3641
Attorney Docket No.	02W234

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 50-0616 Deposit Account Name: Raytheon Company

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☑ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 20 or HP =	_____	x _____	=	_____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 3 or HP =	_____	x _____	=	_____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
_____	- 100 =	_____	/ 50 =	_____	(round up to a whole number) x	_____	=	_____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): APPEAL BRIEF	500

SUBMITTED BY

Signature	Leonard A. Alkov	Registration No. (Attorney/Agent) 30,021	Telephone 310-647-2577
Name (Print/Type)	Leonard A. Alkov		Date March 16, 2007

PD-02W234

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	
MARY MORABITO O'NEILL et al.	)	GAU: 3641
Ser. No. 10/615,133	)	Examiner: CHAMBERS, T.
Filed: July 8, 2003	)	
For: OBSCURATION METHOD FOR	)	
REDUCING THE INFRARED	)	
SIGNATURE OF AN OBJECT	)	

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

Applicant files its Appeal Brief, together with a Fee Transmittal authorizing the charging of the required fee. A Notice of Appeal and fee were previously filed.

Real party in interest

The real party in interest is the assignee, Raytheon Company.

Related appeals and interferences

Applicant is not aware of any related appeals and/or interferences.

Status of claims

Claims 1-22 were filed. Claims 23-26 were added during prosecution. Claims 3, 5, 7, 9, and 10 were withdrawn by the examiner. Claims 1, 14, 17, and 22-26 were amended during prosecution.

Claims 1, 2, 4, 6, 8, and 11-26 are finally rejected and are appealed. The appealed claims are set forth in Appendix I.

Status of amendments

Applicant filed a Response to the Final Office Action of January 31, 2006, but it had no claim amendments.

The Examiner then issued an Advisory Action on March 28, 2006 in which claims 17 and 23, which had not been previously rejected, were finally rejected on the first action in an attachment to the Advisory Action.

The Examiner then issued yet another Final Office Action on October 13, 2006, in which claims 17 and 23, which had not been previously rejected other than in the Advisory Action of March 28, 2006, were again finally rejected on the first action. Applicant had no opportunity to fairly respond to these rejections and accordingly filed no response.

Applicant will treat the last Final Office Action of October 13, 2006 as the "Final Office Action" as discussed herein.

Summary of claimed subject matter

The present claims are method claims. The steps of the method are illustrated n Figure 1. An aircraft in flight that is using the present approach is illustrated in Figures 2-5. Figures 2-5 illustrate various locations on the aircraft in flight from which the obscuring agent may be ejected. Figure 4-5 illustrate exemplary sources of the obscuring agent in schematic form. The claimed approaches are discussed at para. [0024]-[0028] and para. [0030]-[0036].

There are three independent claims.

Claim 1 recites a method for obscuring an aircraft (30) from infrared detection from an external viewing location (56). The method comprises the steps of providing the aircraft (30) in flight having an externally viewable hot region (58) associated therewith, wherein the hot region (58) has a temperature greater than 150°C. An external viewing location (56) that is associated with a greatest threat of an attack on the aircraft (30) is determined. The aircraft (30) is provided with a source (45) of an obscuring agent (46), wherein the obscuring agent (46) comprises carbon dioxide gas, or water vapor, or a mixture thereof. The obscuring agent (46) is ejected from a dispensing location (54) on the aircraft (30) so as to flow between the hot region (58) and the external viewing location (56), wherein the obscuring agent (46) has a temperature of less than that of the hot region (58).

Claim 17 recites a method for obscuring an aircraft (30) from infrared detection from an external viewing location (56), comprising the step of providing a transport aircraft (30) in flight having an externally viewable hot region (58) associated therewith. The hot region (58) has a temperature greater than 150°C. The method further includes providing on the aircraft (30) a source (45) of an obscuring agent (46), wherein the obscuring agent (46) comprises a mixture of carbon dioxide gas and water vapor, and ejecting the obscuring agent (46) from a dispensing location (54) on the aircraft (30) so as to flow between the hot region (58) and the external viewing location (56). The obscuring agent (46) has a temperature of less than that of the hot region (58). The dispensing location (54) is on an engine nacelle (60) of the aircraft (30) forward of an aft end (64) of an engine (38) contained within the nacelle (60), or on a wing (36) of the aircraft (30), or on a fuselage (32) of the aircraft (30) just ahead of an auxiliary power unit (42).

Claim 22 recites a method for obscuring an aircraft (30) from infrared detection from an external viewing location (56). The method includes providing the aircraft (30) in flight having an externally viewable hot region (58) associated therewith, wherein the hot region (58) has a temperature greater than 150°C. A source (45) of an obscuring agent (46) is provided, wherein the obscuring agent (46) is stored on board the aircraft (30) or generated on board the aircraft (30), and wherein the obscuring agent (46) comprises carbon dioxide gas, or water vapor, or a

mixture thereof. The method further includes ejecting the obscuring agent (46) from a dispensing location (54) so as to flow between the hot region (58) and the external viewing location (56) but not to cool the hot region (58). The obscuring agent (46) has a temperature of less than that of the hot region (58). The dispensing location (54) is on an engine nacelle (60) of the aircraft (30) forward of an aft end (64) of an engine (38) contained within the nacelle (60), or on a wing (36) of the aircraft (30), or on a fuselage (32) of the aircraft (30) just ahead of an auxiliary power unit (42).

Grounds of rejection to be reviewed on appeal

Ground 1. Claims 1, 2, 4, 6, 8, and 11-16 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement.

Ground 2. Claims 1, 2, 4, 6, 8, and 11-16 are rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement.

Ground 3. Claims 1, 2, 4, 6, 14, 15, 16, 22, 23, 24, and 26 are rejected under 35 USC 102 as anticipated by Herlik US Patent 5,549,259.

Ground 4. Claims 1, 2, 4, 6, 14, 15, 16, 22, 23, 24, and 26 are rejected under 35 USC 102 as anticipated by Loucks US Patent 5,269,132.

Ground 5. Claims 1, 2, 4, 6, 11, 14, 16, 22, 23, 24, and 26 are rejected under 35 USC 102 over US Patent 4,979,571 to MacDonald.

Ground 6. Claims 1, 2, 4, 6, 8, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, and 25 are rejected under 35 USC 102 as anticipated by "Space Shuttle" together with the cited supporting documents to establish inherent design features.

Argument

Background of the Claimed Subject Matter

The following background aids understanding the context of the invention, and is drawn primarily from para. [0002]-[0004] of the Specification and other locations of the Specification set forth below.

Man-portable infrared-guided missile systems are widely available throughout the world to terrorists, at relatively low cost. When the missile is used to attack an aircraft, the seeker of the guidance system of the missile acquires a heat source of the aircraft, typically associated with the main propulsion engines. The missile is fired and guided to the target by the large infrared signature of the heat source.

An aircraft is particularly vulnerable to such an attack during takeoff and landing, when it is flying at low altitude and relatively slowly. The area within the security perimeter of an airport is usually secure. However, a terrorist may fire an infrared-guided missile at the aircraft from a hidden location several miles outside the airport security perimeter but near the takeoff flight path or the landing glide path. The seeker of the missile is typically sufficiently sensitive that it can acquire and home on the aircraft heat source from such distances. It is difficult for the aircraft to identify the missile threat, even if the aircraft has an infrared-source detector on board. There are many other infrared sources, such as factories and fires, present and visible from the aircraft during the low-level flight of takeoff and landing, which can confuse the infrared-source detector. Additionally, it is difficult for the aircraft to take evasive action when it is flying at low altitude and slowly, as occurs during takeoff and landing.

To protect against such attacks, either in low-level or high-level flight, many military aircraft carry flares that may be deployed if an infrared threat is sensed. The deployed flares create an alternative target to draw the attention of the missile seeker away from the aircraft. The use of flares for civilian aircraft such as commercial transport aircraft is not generally feasible for at least three reasons. First, the flares

are normally deployed only when a threat is sensed. The aircraft therefore must carry an infrared threat warning system, which is expensive and not always reliable in situations where there are many nearby heat sources on the ground. Second, civilian aircraft typically operate from airports that are much less secure than are military airfields, and are therefore at greater risk from terrorist attack, requiring a heavy use of flares. Third, the use of countermeasures such as flares on a widespread scale is not socially and environmentally acceptable for most civilian locations such as airports in and near large cities, because the flares draw too much attention of persons on the ground and because of the debris of the flares that may be dangerous and/or cause fires on the ground.

The present invention was therefore developed as an approach to protecting aircraft in flight, particularly low-level flight during takeoff and landing, from attack by infrared-guided missiles. The protection is afforded by common materials--typically water and carbon dioxide--that can be ejected by the aircraft so as to lie between the heat sources on the aircraft and an external viewing location that is associated with a greatest threat of an attack on the aircraft.

The obscuring agent that is ejected is water or carbon dioxide or a mixture, optionally with the addition of other obscurants. Some of the rejections are premised on the use of water and carbon dioxide for putting out fires, which are hot. However, water and carbon dioxide are used in those situations because they either remove heat (in the case of water) from the combustion or remove oxygen (in the case of carbon dioxide). They are not used to fight fires because they obscure the infrared energy produced by the heat source.

As stated in the present application at many locations such as para. [0012], "The obscuring agent thereby absorbs infrared energy that would otherwise reach the external viewing location and serve as the infrared signature which a missile seeker may use to acquire and home in on the aircraft. The obscuring agent does not act in the manner of a quench to cool the infrared source." Para. [0028] explains "When cool, carbon dioxide gas and water vapor are strong infrared absorbers".

That is, the water and carbon dioxide are ejected to lie between the heat source on the aircraft and the likely missile threat location to provide a "screen" that

reduces the amount of infrared energy that can reach the missile seeker from the heat source on the aircraft. They do not cool the infrared source on the aircraft.

Water and carbon dioxide do not cause concern when they are used above civilian population areas near airports, because they are naturally occurring in the environment. Thus, the present approach protects the aircraft from attack by an infrared-guided missile but does not require the use of socially unacceptable chemicals or flare-type devices that may be objectionable when used over and in civilian communities.

Sec. 112 Rejections

Ground 1. Claims 1, 2, 4, 6, 8, and 11-16 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement.

Ground 2. Claims 1, 2, 4, 6, 8, and 11-16 are rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement.

Applicant traverses both of these rejections. The rejections are directed to the same language in the claims, and are addressed together.

The explanation of the rejection refers to two portions of claim 1: the limitation that the aircraft be "provided in flight" and the limitation that an external viewing location be determined based on a "greatest threat".

The examiner states that it is his position that "the original specification did not describe such a procedure and is, therefore, new matter." Applicant traverses this position.

The "provided in flight" limitation is disclosed in the Specification at multiple locations, including the following locations: para. [0003] and [0004] of Background; para. [0007], first sentence; para. [0024], particularly second sentence stating "The aircraft 30 in flight is provided, step 20."; para. [0033], first sentence; as-filed claim 1; as-filed claim 17; Abstract

The "greatest threat" limitation is disclosed in the Specification at multiple locations, including the following locations: para. [0013], particularly third sentence

stating "It is important to concentrate the obscuring agent in the lines of sight from the source of the infrared energy on the aircraft to the most-probable external viewing locations characterizing the areas of the greatest threat...".

Following the discussion of "providing the aircraft in flight" in para. [0007], the Specification goes on to identify the external viewing location that is associated with the greatest threat of an attack on the aircraft in flight. The greatest thrust of the present disclosure is simply to inform the person of ordinary skill in the art that directionality of threat must be considered. By contrast, in most cases flare patterns are ejected independently of the direction of the threat--once a threat is identified, the flares are ejected in a preset pattern. The present Specification informs the person of ordinary skill that the directionality of the threat must be considered and determined, because the ejection locations are chosen so that the ejected obscurant lies between the hot spots on the aircraft and the direction of greatest threat. Para. [0013]-[0015] set forth the basic approach:

> **"[0013]** The present approach requires the judicious selection of the dispensing location(s) on the aircraft. The present invention does not seek to select those dispensing locations in detail, but some general principles may be set forth here. It is important to concentrate the obscuring agent in the lines of sight from the source of the infrared energy on the aircraft to the most-probable external viewing locations characterizing the areas of the greatest threat, because the beneficial effect of the obscuring agent increases as its concentration in the line of sight increases. [emphasis added]
>
> **[0014]** There is no need to provide obscuration of many parts of the aircraft, such as those that are at less than 150°C, which are so cool that they do not serve as significant infrared sources. The dispensing locations need not be positioned to obscure such cool-operating locations on the aircraft. The most significant infrared source on the aircraft is its engines, both the main propulsion engines and any auxiliary engines such as the auxiliary power unit, which emit hot exhaust gas. The hot carbon dioxide and water vapor in the hot

exhaust gas, as well as the hot engine surfaces, are primary sources of the infrared signature of the aircraft, for example. The present approach will normally be applied to obscure the infrared emissions of the engines and their hot exhaust plumes. This may be done by dispensing the obscuring agent from dispensing locations just ahead of the hot surfaces and exhaust plumes of the engines, so that the obscuring agent flows between the hot surfaces and the exhaust plumes, on the one hand, and the most likely external viewing locations, on the other. The present approach allows the obscuring agent to be dispensed to obscure any other infrared sources on the aircraft that may also be present.

[0015] Another consideration of the dispensing location is the location of the most-probable external viewing locations. The infrared missile threats are most likely to come from below the aircraft in the takeoff/landing scenario of most interest, including locations in front of, laterally to, and behind the aircraft. The external viewing location of the threat is unlikely to be above the aircraft. The dispensing locations can therefore be tailored to provide the greatest obscuration below the aircraft, to its front, sides, and rear."

Para. [0033] further elaborates on this approach:

"Because the external viewing locations 56 are normally below the aircraft 30, the dispensing locations 54 for the main propulsion engines 38 may be concentrated so as to distribute the greatest amount of the obscuring agent 46 to obscure lines of sight to external viewing locations 56 which are below, and also in front of, on the sides of, and behind the aircraft 30."

Applicant has therefore informed the person of ordinary skill that directionality of threat must be considered, and provided in the Specification the determination of the external viewing location that is associated with a greatest

threat of an attack on the aircraft, in the situation of most interest of takeoff and landing of the aircraft.

In other cases, there may be other viewing locations associated with the greatest (most probable) threat. For example, if an airport is laid out so that an aircraft takes off over the ocean with land close on the right hand side, then the right hand side of the aircraft may be the "external viewing location that is associated with a greatest threat of an attack on the aircraft". Applicant cannot identify all possible threat directions, but has done so for the general takeoff/landing scenario of most interest, and given the guidelines for other scenarios.

The thrust of the rejection is that those operating an airport or an aircraft using the airport will not be able to figure out the viewing locations that are associated with the greatest threats of an attack by an infrared guided missile. With the guidance of the present Specification, Applicant submits that is not the case.

Sec. 102 Prior Art Rejections

Before addressing the art rejections of Grounds 3-6, Applicant notes that none of the prior art deals with the subject matter of the invention, "A method for obscuring an aircraft from infrared detection from an external viewing location". Most of the prior art deals with something else, such as firefighting, and the Examiner seeks to fit them into the present claim language. The strained nature of these interpretations will be apparent from the following discussion.

Loucks does deal with attacks on aircraft, but proposes an approach diametrically opposite to that of the present invention. Loucks cools off the hot structure rather than obscures the hot structure without cooling it. The Loucks approach results in a loss of thermodynamic efficiency.

Ground 3. Claims 1, 2, 4, 6, 14, 15, 16, 22, 23, 24, and 26 are rejected under 35 USC 102 as anticipated by Herlik US Patent 5,549,259. Applicant traverses this ground of rejection.

The following principle of law applies to sec. 102 rejections. MPEP 2131 provides: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the ... claim. The elements must be arranged as required by the claim..." [citations omitted] This is in accord with the decisions of the courts. Anticipation under section 102 requires 'the presence in a single prior art disclosure of all elements of a claimed invention arranged as in that claim.' Carella v. Starlight Archery, 231 USPQ 644, 646 (Fed. Cir., 1986), quoting Panduit Corporation v. Dennison Manufacturing Corp., 227 USPQ 337, 350 (Fed. Cir., 1985)

Thus, identifying a single element of the claim which is not disclosed in the reference is sufficient to overcome a Sec. 102 rejection.

Claim 1 recites in part:

> "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft"

Herlik discloses a method and structure for aerial fire fighting. It does not deal with threats to an aircraft, and accordingly there is no disclosure of "determining" as recited above.

The position of the explanation of the rejection that a fire can be considered an attack on an aircraft (Final Office Action, page 3, line 17-20), though novel and creative, is without any support in the reference. In any event, Herlik has no disclosure of "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft", nor does the explanation of the rejection identify any such disclosure in Herlik. The explanation of the rejection argues that "A viewing location is established within the stream of fluid", but there is no reference to a source in Herlik of such a disclosure. Herlik does not disclose any

attempt to view the aircraft from within the stream of fluid or from anywhere else for that matter.

The Response to Arguments at para. 30 on page 14 of the Final Office Action asserts that the claims "merely require an external viewing location which is inherent in each prior art reference." That position is incorrect, and seeks to short quote the actual claim limitation. What is required is "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft". This reference, as well as all of the other references applied in rejecting the present claims, does not have any disclosure of this limitation.

Claim 1 further recites in part:

> "ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, wherein the obscuring agent has a temperature of less than that of the hot region."

Because no "external viewing location" is determined by Herlik, it is not possible to eject the obscuring agent between the hot region and any external viewing location.

The explanation of this sec. 102 rejection, and of the other sec. 102 rejections, reflect a misconception about the nature of a sec. 102 rejection. As quoted above from MPEP 2131, a claim is anticipated only if each and every element as set forth in the claim is found in a single prior art reference. The construction of a sec. 102 rejection is not an invitation for the examiner to speculate in an attempt to create disclosure that is not found in the reference, to support a hindsight reconstruction of the present claims. The arguments about fire being an "attack" and that a viewing location could be established in the stream of fluid are not disclosures found in the reference. They are speculations made in a hindsight attempt to force a favorable interpretation on an unrelated disclosure. In any event, there is no disclosure of a determination of an external viewing location that is associated with a greatest threat of an attack on the aircraft, a recited claim

limitation. The explanation of a sec. 102 rejection must point to the location in the reference of every disclosed limitation of the claim under consideration, and that has not been done here for any of the grounds of rejection.

Claims depending from claim 1 contain these same limitations, and other limitations as well that distinguish their claimed subject matter.

Claim 2 recites a "transport aircraft". Herlik has no disclosure of a transport aircraft.

Claim 4 recites "providing the aircraft wherein the hot region is a plume of hot gas flowing from the aircraft." Herlik has no disclosure that the hot region being obscured is a plume of hot gas flowing from the aircraft.

Claim 6 recites "providing the source of the obscuring agent comprising a supply of the obscuring agent generated on board the aircraft." Herlik does not disclose that any obscuring agent is generated on board the aircraft.

Claim 14 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of an auxiliary power unit of the aircraft." Herlik does not mention an auxiliary power unit.

Claim 15 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of a main propulsion engine of the aircraft.". Herlik does not disclose any attempt to obscure a portion of the exhaust gas of a main propulsion of the aircraft.

Claim 16 recites "ejecting the obscuring agent at a temperature of less than about 150°C." Herlik does not mention the ejection temperature of any obscuring agent.

The explanation of the rejection does not mention any of these claims or any of the claim limitations. The Board can only await their discussion in the Examiner's Answer.

Claim 22 recites in part:

> "wherein the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on

a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit."

The dispensing location of the aerial firefighting fluid from the aircraft in Herlik is from the very aft end of the fuselage, at locations indicated as 9 in Figure 3 (col. 8, lines 41-44). It is not from any location set forth in the above-quoted recitation from claim 22. This limitation is not even addressed in the explanation of the rejection.

Claims depending from claim 22 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 23 recites in part:

"providing the aircraft that does not carry flares and does not have an active infrared threat warning system."

There is no disclosure in Herlik of this negative limitation. The explanation of the rejection, in the last sentence on page 3 of the Final Office Action, argues that "The A-10 is not disclosed as having an infrared warning system or flares." That is not what is required to anticipate a negative limitation. There must be a disclosure of the recited negative limitation. This requirement is not met by an absence of a disclosure of a positive limitation.

Claim 26 recites "ejecting the obscuring agent so that it is not initially mixed with the plume". From Figure 3 of Herlik, it appears that the water ejected by Herlik would be initially mixed with the plume from the engines."

Ground 4. Claims 1, 2, 4, 6, 14, 15, 22, 23, 24, and 26 are rejected under 35 USC 102 as anticipated by Loucks US Patent 5,269,132. Applicant traverses this ground of rejection.

Applicant incorporates the requirements for a sec. 102 rejection from the discussion of Ground 3.

Claim 1 recites in part:

"determining an external viewing location that is associated with a greatest threat of an attack on the aircraft"

Loucks has no such disclosure, nor does the explanation of the rejection assert that Loucks has such a disclosure or point out a location in Loucks where there is such a disclosure.

Claim 1 recites in part:

"providing on the aircraft a source of an obscuring agent, wherein the obscuring agent comprises carbon dioxide gas, or water vapor, or a mixture thereof;"

Loucks discloses the use of a coolant (col. 3, lines 32-54) but not an obscuring agent. As discussed at col. 3 lines 45-48 of Loucks, the coolant functions by reducing the temperature of the engine surfaces and then mixes into the exhaust gas to cool the exhaust. This will have a direct negative effect on the thermodynamic efficiency of the engine, resulting in reduced power at the time it is needed the most, takeoff.

Para. [0012] of the Specification discusses and distinguishes such approaches:

"The obscuring agent does not act in the manner of a quench to cool the infrared source...This approach reduces the thermodynamic efficiency of the engine and requires such a large amount of coolant that the aircraft operation may be economically infeasible. The obscuring agent instead acts to block the infrared energy in the line of sight between its source and the external viewing location."

Claim 1 further recites in part:

"ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, wherein the obscuring agent has a temperature of less than that of the hot region."

Loucks has no such disclosure.

Claims depending from claim 1 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 2 recites a "transport aircraft". Loucks has no disclosure of a transport aircraft.

Claim 4 recites "providing the aircraft wherein the hot region is a plume of hot gas flowing from the aircraft." Loucks has no disclosure that the hot region being obscured is a plume of hot gas flowing from the aircraft.

Claim 6 recites "providing the source of the obscuring agent comprising a supply of the obscuring agent generated on board the aircraft." Loucks does not disclose that any obscuring agent is generated on board the aircraft.

Claim 14 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of an auxiliary power unit of the aircraft." Loucks does not mention an auxiliary power unit.

Claim 15 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of a main propulsion engine of the aircraft.". Loucks does not disclose any attempt to obscure a portion of the exhaust gas of a main propulsion of the aircraft with an obscuring agent that is between the exhaust gas and an external viewing location.

Claim 16 recites "ejecting the obscuring agent at a temperature of less than about 150°C." Loucks does not mention the ejection temperature of any obscuring agent or of its coolant.

The explanation of the rejection does not mention any of these claims or any of the claim limitation. The Board can only await their discussion in the Examiner's Answer.

Claim 22 recites in part:

> "ejecting the obscuring agent from a dispensing location so as to flow between the hot region and the external viewing location but not to cool the hot region"

Loucks expressly discloses that its approach cools the hot region, see col. 2, lines 16-27 and col. 3, lines 45-48. The whole point of the approach of Loucks is to cool the hot region to reduce its emissivity.

Claim 22 further recites in part:

> "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit."

Loucks has no such disclosure. There is no disclosure in Loucks that any dispensing location is on the engine nacelle (or in Loucks' case, the cowling 12). Loucks passes a liquid coolant through the interior of the panels 4, and the liquid coolant leaves the panels 4 at their aft ends. Figure 1 of Loucks depicts the panels 4 through which the liquid coolant passes. The panels 4 are inside the cowling 12. The above-quoted language of claim 22 makes it clear that the dispensing location is on the nacelle that contains the engine, not on the engine itself.

Claims depending from claim 22 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 23 recites in part:

> "providing the aircraft that does not carry flares and does not have an active infrared threat warning system."

There is no disclosure in Loucks of this negative limitation. The explanation of the rejection, in the next-to-last sentence on page 4 of the Final Office Action, argues that "The aircraft is not disclosed as having a flare or early warning system." That is not what is required to anticipate a negative limitation. There must be a disclosure of the recited negative limitation. This requirement is not met by an absence of a disclosure of a positive limitation.

Claim 24 recites in part:

"preferentially ejecting the obscuring agent to obscure most-likely lines of sight which are below, in front of, on the sides of, and behind the aircraft."

Loucks has no disclosure of this limitation, and the explanation of the rejection does not address it.

Claim 26 recites "ejecting the obscuring agent so that it is not initially mixed with the plume". From Figures 1 and 3 of Loucks, it appears that the vaporized coolant ejected by Loucks would be initially mixed with the plume from the engines." Cooling of the exhaust gas temperature will directly reduce engine performance, at the critical takeoff time.

Ground 5. Claims 1, 2, 4, 6, 11, 14, 16, 22, 23, 24, and 26 are rejected under 35 USC 102 over US Patent 4,979,571 to MacDonald. Applicant traverses this ground of rejection.

Applicant incorporates the requirements for a sec. 102 rejection from the discussion of Ground 3.

McDonald discloses a firefighting system in which foam is sprayed from a nozzle on the front of a helicopter (Figure 4). The primary thrust of the explanation of the rejection is that "A viewer at reference number 122 with infrared can see the heat given off by the engines of the helicopter." However, McDonald has no disclosure of a viewer at the fire target area 122, and the explanation of the rejection does not point out any location in McDonald where there is such a disclosure. As discussed above in relation to the Ground 3 rejection, this is another instance of the examiner relying on speculation rather than the disclosure of the reference.

Claim 1 recites in part:

"providing the aircraft in flight having an externally viewable hot region associated therewith, wherein the hot region has a temperature greater than 150°C".

MacDonald has no such disclosure, nor does the explanation of the rejection point out any location in MacDonald having such a disclosure.

Claim 1 further recites in part:

> "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft"

MacDonald depicts in Figure 4 a firefighting. A foam mixture is sprayed out of the front-mounted and generally forward-facing nozzle 66. There is no action taken to determine an external viewing location that is associated with a greatest threat of an attack on the aircraft. The reference in the explanation of the rejection to "a viewing location 122" is incorrect. In MacDonald, numeral 122 refers to "fire target area 122" (col. 8, line 54). There is no disclosure in MacDonald that there is a determination that fire target area 122 is associated with a greatest threat of an attack on the helicopter.

Claims depending from claim 1 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 2 recites a "transport aircraft". McDonald has no disclosure of a transport aircraft.

Claim 4 recites "providing the aircraft wherein the hot region is a plume of hot gas flowing from the aircraft." McDonald has no disclosure that the hot region being obscured is a plume of hot gas flowing from the aircraft.

Claim 6 recites "providing the source of the obscuring agent comprising a supply of the obscuring agent generated on board the aircraft." McDonald does not disclose that any obscuring agent is generated on board the aircraft.

Claim 14 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of an auxiliary power unit of the aircraft." McDonald does not mention an auxiliary power unit.

Claim 15 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of a main propulsion engine of the aircraft.". McDonald does not disclose any attempt to obscure a portion of the exhaust gas of a main propulsion of the aircraft.

Claim 16 recites "ejecting the obscuring agent at a temperature of less than about 150°C." McDonald does not mention the ejection temperature of any obscuring agent.

The explanation of the rejection does not mention any of these claims or any of the claim limitation. The Board can only await their discussion in the Examiner's Answer.

Claim 22 recites in part:

> "providing the aircraft in flight having an externally viewable hot region associated therewith, wherein the hot region has a temperature greater than 150°C;"

MacDonald has no such disclosure, nor does the explanation of the rejection point out any location in MacDonald having such a disclosure, nor does the explanation of the rejection point out any such disclosure.

Claim 22 further recites in part:

> "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit"

The dispensing location of the foam from the helicopter in MacDonald is from the forward-mounted and forward-facing nozzle 66, see Figure 4 and the disclosure of MacDonald. It is not from any location set forth in the above-quoted recitation from claim 22.

Claims depending from claim 22 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 23 recites in part:

> "providing the aircraft that does not carry flares and does not have an active infrared threat warning system."

There is no disclosure in McDonald of this negative limitation. The explanation of the rejection, in the next-to-last sentence on page 4 of the Final Office Action, argues that "There is no disclosure of flares or infrared systems on the helicopter." That is not what is required to anticipate a negative limitation. There must be a disclosure of the recited negative limitation. This requirement is not met by an absence of a disclosure of a positive limitation.

Claim 24 recites in part:

> "preferentially ejecting the obscuring agent to obscure most-likely lines of sight which are below, in front of, on the sides of, and behind the aircraft."

McDonald has no disclosure of this limitation, and the explanation of the rejection does not address it.

Ground 6. Claims 1, 2, 4, 6, 8, 11, 12, 14, 15, 17, 18, 19, 20, 22, 23, 24, and 25 are rejected under 35 USC 102 as anticipated by "Space Shuttle" together with the cited supporting documents to establish inherent design features. Applicant traverses this ground of rejection.

Applicant incorporates the requirements for a sec. 102 rejection from the discussion of Ground 3.

The explanation of the rejection in para. 10 and 11 at pages 7-8 of the Final Office Action does not address the claim limitations. Applicant will do so.

Claim 1 recites in part:

> "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft;"

Space Shuttle discloses an earth-launched space vehicle. It does not deal with threats of an attack to the space shuttle, and accordingly there is no disclosure

of the "determining" step as recited above. The explanation of the rejection does not address this limitation, and does not point out in any of the supporting documents where there is a disclosure of this limitation.

Claim 1 further recites in part:

> "providing on the aircraft a source of an obscuring agent, wherein the obscuring agent comprises carbon dioxide gas, or water vapor, or a mixture thereof"

To the Examiner, the "obscuring agent" is the combustion product of the solid propellant boosters (Final Office Action, page 8, lines 3-4). There is no showing that the combustion product is carbon dioxide gas or water vapor.

Instead, the Examiner takes the position that the exhaust "inherently" includes traces of carbon dioxide and water. MPEP 2112-2113 sets forth the law on inherency. Inherency is not to be taken lightly and not to be asserted unless there is good evidence to suggest that the asserted property or characteristic is necessarily present in the teachings of the prior art reference. The concept of inherency is not provided as a way to fill in the gaps in missing disclosure or teachings based upon speculation, unless the asserted property or characteristic may be shown to be necessarily present by objective evidence. Instead, "inherency" is used when every aspect of the disclosure of a reference and the claimed subject matter is otherwise exactly the same, then it may be inferred that some property or characteristic further recited in the claim must necessarily be present in the art reference. MPEP 2112 provides "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d

743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)" If the rejection is maintained, the Examiner must provide the basis for the assertion of inherency. Applicant does not know one way or the other, but if the Examiner asserts inherency, he must establish it as provided by MPEP 2112-2113.

Claim 1 also recites in part:

> "ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, wherein the obscuring agent has a temperature of less than that of the hot region."

None of the references disclose this limitation, nor has the explanation of the rejection pointed out where the references disclose this limitation. The external viewing location is the location associated with a greatest threat of an attack on the aircraft. No thread of attack on the shuttle is discussed in any of the references dealing with the space shuttle.

Applicant appreciates the examiner's humor in the explanation of the rejection. Applicant cannot resist observing that a person standing under the engines (Office Action, page 7, last three lines on page and page 8, lines 7-9) would not view the plume created by the engines for very long.

Claims depending from claim 1 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 6 recites "providing the source of the obscuring agent comprising a supply of the obscuring agent generated on board the aircraft." Space Shuttle does not disclose that any obscuring agent is generated on board the aircraft.

Claim 11 recites in part: "providing a mixture of carbon dioxide gas and water vapor as the obscuring agent." See the prior discussion of inherency. The

Board and Applicant await the Examiner's demonstration of "inherency" of his asserted position.

Claim 12 recites in part: "providing solid-material particles in the obscuring agent." Again, the rejection is based on an assertion of "inherency". If the rejection is maintained, the Examiner must establish the inherency as discussed above.

Claim 13 recites "providing solid metal particles in the obscuring agent." Applicant notes that in the discussion of the various dependent claims, there is no reference to the source of the disclosure in any case. For example, regarding claim 13 (and claim 21 depending from claim 17), the article "Solid Rocket Booster" does not disclose the claim limitation, "providing solid metal particles in the obscuring agent". Aluminum may be present, but it is likely in a vaporous form. In any event, the reference must disclose that the aluminum (or other metal) is present in the form of particles. There is no such disclosure, nor does the explanation of the rejection point to any such disclosure in the references. The explanation of the rejections of many of the other dependent claims suffer from the same problem.

Claim 14 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of an auxiliary power unit of the aircraft." Space Shuttle does not mention an auxiliary power unit. The explanation of the rejection observes that the shuttle has 3 main engines and 2 SRBs, but it does not discuss an auxiliary power unit.

Claim 15 recites "ejecting the obscuring agent so as to obscure a portion of an exhaust gas of a main propulsion engine of the aircraft.". Space Shuttle does not disclose any attempt to obscure a portion of the exhaust gas of a main propulsion of the aircraft.

Claim 17 recites in part:

> "ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, <u>wherein the obscuring agent has a temperature of less than that of the hot region</u>" [emphasis added]

None of the references discussing the space shuttle has any such disclosure, nor does the explanation of the rejection point out any such disclosure in the references. The examiner has defined a difficult position for himself, arguing that the plume of the solid rocket boosters is cooler than some hot region on the space shuttle. The Examiner has not identified what the "hot region" is, and certainly has not endeavored to meet the challenge of demonstrating that the "obscuring agent" is at a temperature of less than the "hot region".

Claim 17 further recites in part:

> "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft".

The dispensing location of the exhaust from the space shuttle engines is from the aft end of the side-mounted SRBs. It is not from any location set forth in the above-quoted recitation from claim 22. This limitation is not addressed in the explanation of the rejection.

Claims depending from claim 17 include these limitations and additionally include other limitations that make them patentable.

Claim 18 recites in part: "providing an additional source of the obscuring agent as a supply of the obscuring agent carried on board the aircraft". The position of the explanation of the rejection is that the obscuring agent is the combustion product in the exhaust of the solid rocket boosters (Final Office Action, page 8, lines 4-7). There is no supply of combustion product of the solid rocket boosters carried on board the space shuttle.

Claim 20 recites in part: "providing the source of the obscuring agent comprising a mixture of carbon dioxide gas, water vapor, and solid-material particles." As discussed earlier, the Examiner's assertion of inherency of traces of carbon dioxide gas and water vapor in the combustion gas of the SRB remains to be established.

Claim 21 recites in part: "providing the source of the obscuring agent comprising a mixture of carbon dioxide gas, water vapor, and solid metal particles.".

As discussed earlier, the Examiner's assertion of inherency of traces of carbon dioxide gas and water vapor in the combustion gas of the SRB remains to be established. There has been no factual basis set forth that there are solid metal particles in the combustion exhaust of the SRBs.

Claim 22 recites in part:

> "ejecting the obscuring agent from a dispensing location so as to flow between the hot region and the external viewing location but not to cool the hot region"

None of the references discloses the recited negative limitation "flow between the hot region and the external viewing location but not to cool the hot region". The explanation of the rejection does not even mention this limitation.

Claim 22 further recites in part:

> "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit".

The dispensing location of the exhaust from the space shuttle SRBs is from the aft end of the side mounted SRBs. It is not from any location set forth in the above-quoted recitation from claim 22.

Claims depending from claim 22 contain this same limitation, and other limitations as well that distinguish their claimed subject matter.

Claim 23 recites in part:

> "providing the aircraft that does not carry flares and does not have an active infrared threat warning system."

There is no disclosure in Space Shuttle of this negative limitation. Para. 27 of the Final Office Action argues that "The references provided do not disclose the

shuttle having flares or infrared threat warning system." That is not what is required to anticipate a negative limitation. There must be a disclosure of the recited negative limitation. This requirement is not met by an absence of a disclosure of a positive limitation.

Claim 25 recites: "ejecting the obscuring agent at a rate of at least 4 pounds per second per 100 watts per steradian of infrared energy produced by the hot region." There is no such disclosure in any of the references dealing with space shuttle. Any actual values cannot be calculated based upon the explanation of the rejection, inasmuch as the examiner has not identified what the "hot region" is.

Summary and Conclusion

The sec. 112 rejections are groundless. Applicant disclosed the limitation that the aircraft be "provided in flight" at multiple locations in the Specification and the as-filed claims. Applicant disclosed that an external viewing location must be determined. Applicant disclosed how to determine an external viewing location based on a "greatest threat", and concluded for the cases of interest--takeoff and landing--that it was behind, below, in front of, or on the sides of the aircraft. Guidelines were given for other situations.

With the exception of Loucks, none of the prior art references deal with the problem addressed by the present invention, protecting an aircraft from attack. Accordingly, the determining, ejecting, and other steps discussed herein are not disclosed in the art, regardless of how the explanations of the rejections seek to stretch disclosures to attempt to find an "attack" or the like when the circumstances disclosed in the references do not suggest an "attack".

Loucks discloses an approach that is exactly the opposite of what the present approach achieves. Loucks seeks to cool the hot areas, rather than obscure them. Applicant discussed above and in the present Specification the loss of thermodynamic efficiency resulting from an approach such as Loucks.

All of the rejections of claim 1 and its dependent claims are premised on the attempt to find in the references the limitation "determining an external viewing location that is associated with a greatest threat of an attack on the aircraft", where

no such threat of attack is disclosed or implied. A fire on the ground, for example, does not "attack" an aircraft.

The rejection of claim 17 and its dependent claims on space shuttle (Ground 6) doesn't even mention a key limitation: "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit." The explanation of the rejection argues that the obscurant is the combustion gas of the solid rocket boosters. That exhaust gas does not leave the space shuttle at any of these recited locations.

The various rejections also ignore that same recited limitation of claim 22 and its dependent claims: "the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit" They also ignore the limitation: "ejecting the obscuring agent from a dispensing location so as to flow between the hot region and the external viewing location but not to cool the hot region".

Applicant asks that the Board reverse the rejections.

Respectfully submitted,

Leonard A. Alkov,
Reg. No. 30,021
Attorney for Applicant

APPENDIX I

Copy of Claims Involved in the Appeal

1. A method for obscuring an aircraft from infrared detection from an external viewing location, comprising the steps of

providing the aircraft in flight having an externally viewable hot region associated therewith, wherein the hot region has a temperature greater than 150°C;

determining an external viewing location that is associated with a greatest threat of an attack on the aircraft;

providing on the aircraft a source of an obscuring agent, wherein the obscuring agent comprises carbon dioxide gas, or water vapor, or a mixture thereof; and

ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, wherein the obscuring agent has a temperature of less than that of the hot region.

2. The method of claim 1, wherein the step of providing the aircraft includes the step of

providing a transport aircraft.

4. The method of claim 1, wherein the step of providing the aircraft includes the step of

providing the aircraft wherein the hot region is a plume of hot gas flowing from the aircraft.

6. The method of claim 1, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing the source of the obscuring agent comprising a supply of the obscuring agent generated on board the aircraft.

8. The method of claim 1, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing the source of the obscuring agent as a portion of an exhaust gas of a main propulsion engine of the aircraft.

11. The method of claim 1, wherein the step of providing on the aircraft includes the step of

providing a mixture of carbon dioxide gas and water vapor as the obscuring agent.

12. The method of claim 1, wherein the step of providing on the aircraft includes the step of

providing solid-material particles in the obscuring agent.

13. The method of claim 1, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing solid metal particles in the obscuring agent.

14. The method of claim 1, wherein the step of ejecting includes the step of

ejecting the obscuring agent so as to obscure a portion of an exhaust gas of an auxiliary power unit of the aircraft.

15. The method of claim 1, wherein the step of ejecting includes the step of

ejecting the obscuring agent so as to obscure a portion of an exhaust gas of a main propulsion engine of the aircraft.

16. The method of claim 1, wherein the step of ejecting includes the step of

ejecting the obscuring agent at a temperature of less than about 150°C.

17. A method for obscuring an aircraft from infrared detection from an external viewing location, comprising the steps of

providing a transport aircraft in flight having an externally viewable hot region associated therewith, wherein the hot region has a temperature greater than 150°C;

providing on the aircraft a source of an obscuring agent, wherein the obscuring agent comprises a mixture of carbon dioxide gas and water vapor; and

ejecting the obscuring agent from a dispensing location on the aircraft so as to flow between the hot region and the external viewing location, wherein the obscuring agent has a temperature of less than that of the hot region, and wherein the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit.

18. The method of claim 17, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing an additional source of the obscuring agent as a supply of the obscuring agent carried on board the aircraft.

19. The method of claim 17, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing the source of the obscuring agent comprising a portion of the exhaust gas of a main propulsion engine of the aircraft.

20. The method of claim 17, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing the source of the obscuring agent comprising a mixture of carbon dioxide gas, water vapor, and solid-material particles.

21. The method of claim 17, wherein the step of providing on the aircraft the source of the obscuring agent includes the step of

providing the source of the obscuring agent comprising a mixture of carbon dioxide gas, water vapor, and solid metal particles.

22. A method for obscuring an aircraft from infrared detection from an external viewing location, comprising the steps of

providing the aircraft in flight having an externally viewable hot region associated therewith, wherein the hot region has a temperature greater than 150°C;

providing a source of an obscuring agent, wherein the obscuring agent is stored on board the aircraft or generated on board the aircraft, and wherein the obscuring agent comprises carbon dioxide gas, or water vapor, or a mixture thereof; and

ejecting the obscuring agent from a dispensing location so as to flow between the hot region and the external viewing location but not to cool the hot region, wherein the obscuring agent has a temperature of less than that of the hot region, and wherein the dispensing location is on an engine nacelle of the aircraft forward of an aft end of an engine contained within the nacelle, or on a wing of the aircraft, or on a fuselage of the aircraft just ahead of an auxiliary power unit.

23. The method of claim 1, wherein the step of providing the aircraft includes the step of

providing the aircraft that does not carry flares and does not have an active infrared threat warning system.

24. The method of claim 1, wherein the step of ejecting includes the step of

preferentially ejecting the obscuring agent to obscure most-likely lines of sight which are below, in front of, on the sides of, and behind the aircraft.

25. The method of claim 1, wherein the step of ejecting includes the step of

ejecting the obscuring agent at a rate of at least 4 pounds per second per 100 watts per steradian of infrared energy produced by the hot region.

26. The method of claim 1, wherein the step of providing the aircraft includes the step of

providing the aircraft wherein the hot region is a plume of hot gas flowing from the aircraft, and wherein the step of ejecting includes the step of

ejecting the obscuring agent so that it is not initially mixed with the plume.

APPENDIX II

Evidence Entered and Relied Upon in the Appeal

None

APPENDIX III

Related Proceedings

None